



# Agricultural biodiversity, knowledge systems and policy decisions

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## ► To cite this version:

Clavel Danièle, Fabrice Flipo, Florence F. Pinton. Agricultural biodiversity, knowledge systems and policy decisions. Resilience and development: mobizing for transformation, May 2014, Montpellier, France. pp.4 - 8. cirad-01082572

**HAL Id: cirad-01082572**

**<http://hal.cirad.fr/cirad-01082572>**

Submitted on 13 Nov 2014

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# Agricultural biodiversity, knowledge systems and policy decisions

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Communication RESILIENCE2014, Montpellier (France), 4-8 May, 2014

## 1 Introduction

This presentation is an attempt to merge concepts from the sphere of biology and concepts from the sphere of society and political science for a clearer understanding of the issues and strategies of the stakeholders in agricultural biodiversity (farmers, scientists, agroindustry, policy makers etc.). Special emphasis is placed on knowledge management patterns according to two visions:

In the first vision, rational-technicist thinking, the basic principle is to modify the environment, making it more uniform while introducing and marketing modern genotypes with broad adaptability or specific adaptation. Lean concepts from industry can be implemented to reduce waste, viewed as inherent in traditional processes. The model is inherited from the green revolution and predominates in industrialized countries.

In the second vision, improved traditional practices and local knowledge recognition are increasingly viewed as a way to achieve sustainable development, particularly in developing countries where the agricultural sector largely dominates.

Countries where the second vision still predominates are often in the South where agriculture is a major economic sector and characterized by family farming, unlike in developed countries where intensive specialized agriculture is largely dominant.

Our ambition is to draw attention to the leverages for generating knowledge specified as knowledge for policy and politics in managing agricultural biodiversity (AB).

## 2 Problematic backgrounds

### Setting the Scene

Managing agricultural diversity mainly involves varietal creation methods, intellectual property rights over genetic resources, and access to seeds.

The posture of stakeholders (including scientists) in agricultural biodiversity management and knowledge production greatly depends on underlying beliefs (rational-technicist thinking or community biodiversity management). Hence the generated knowledge has a structure determined by the way in which stakeholders articulate and aggregate their knowledge

**Table 1** shows how the recent history of plant genetics for agriculture and economic political systems shaped the main two emerging visions in the management of agricultural biodiversity: the first vision is globally inspired from the green revolution and the second from the Earth Summit (even historically starting before that).

**Table1: Broad characteristics of cultivated biodiversity management in the two visions**

| Options                         | Scientific vision of agriculture  | Ethical & cultural values  | Political promoters  |
|---------------------------------|---|--|--|
| <b>Technicist Perspective</b>   | Scientific-technological approach (reductionism)<br>Artificialisation of the agricultural environment<br>Intensive Agriculture: monoculture<br>Predominance of <i>ex situ</i> PRG conservation<br>Business oriented genetics<br>Large-scale applications                    | Economic resilience<br>Individual freedom<br>Individual Intellectual property: patents on Life<br>Inclusiveness  | Private sector<br>Private foundation<br>CGIAR, partly,<br>FAO, partly<br>World Bank, partly<br>Financial sector                  |
| <b>Conservation Perspective</b> | Systemic scientific knowledge (co-evolution, adaptation)<br>Managing natural environment sustainably<br>Multi-functionality of agriculture<br>Conservation agriculture (multispecies)<br>Predominance of <i>in situ</i> RG conservation<br>Locally diversified applications | Ecological and cultural resilience<br>Diversity<br>Solidarity<br>Ethical business<br>Collective intellectual property: No patents on Life<br>Inclusiveness | Science and societies Associations<br>Peasant organizations, major share in the South<br>Public research, largely<br>FAO, partly |

Tables 2 details the main characteristics of the knowledge system for each vision: concepts, knowledge management amongst stakeholders and related technical and commercial options that ensue.

**Table 2:Management of knowledge systems in the two visions of agricultural biodiversity**

| Options  | Basic concepts & principles  | Knowledge management processes   | Technical & commercial options  |
|--|--|--|---|
| <b>Technicist Perspective</b><br>(scientific-technological ) | Modelling complexity (Lean management)<br>Excellence/Smart system<br><i>Ex situ</i> PGR management<br>Adaptation by adoption of modern uniform cultivars<br>Technical innovation/ Frugal innovation                      | Global to local<br>Value chain based bonds (interest groups): specialized skill transfers<br>Multidisciplinary approaches in biology and agriculture<br>Technology transfer/External driver<br>Genetic & epigenetic in model plants and inbred lines, principally <i>ex situ</i><br><b>Access to modern varieties for the poor is central to reducing hunger</b> | Specialized technical knowledge<br>Advanced technologies: plant engineering promoted<br>Technical and commercial standards for seeds<br>Building seed markets |
| <b>Conservation Perspective</b><br>(“co-concepts”)           | Governing complexity by the “Commons” concept<br>Social-Ecological System Resilience<br>On-farm <i>in situ</i> PGR management<br>Adaptation by co-learning and knowledge sharing<br>Social Innovation/ Frugal innovation | Local to global<br>Bonds by socialized trust (common belief): co-learning<br>Interdisciplinary approaches in biology, agriculture and social sciences<br>Endogenous social innovation/Internal driver<br>Genetics & epigenetics in diverse plant populations, principally <i>in situ</i><br><b>Managing local AB is vital for food access and resilience</b>     | Local knowledge<br>Agro-ecological knowledge: ecology, ethnobotany<br>Science and societies dialogue<br>Building community seed-banks                         |

Tables gives a very dichotomous picture with limited overlapping : each of the two visions determines a scientific posture, a type of knowledge, how to manage it, etc.

### 3 Concept and definition (Haas, 2001)

**Concept of epistemic communities (derived from Haas PM, 2001, Policy Knowledge)**

#### **Definition**

Epistemic communities are an often transnational network of knowledge based experts with an authoritative claim to policy-relevant knowledge within their field of expertise. Their members share knowledge about the causation of social or physical phenomena in an area for which they have a reputation for competence, and a common set of normative beliefs about what actions will benefit human welfare in such a field.

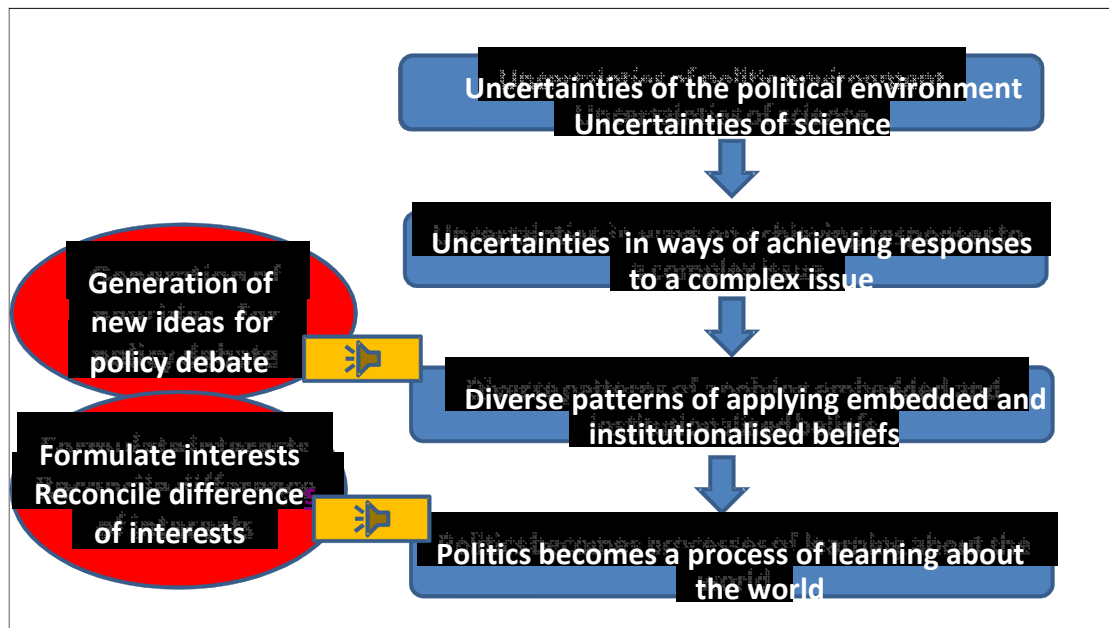
Groups of professionals who have in common:

- Shared value-based rationale/motivation

- Shared causal belief: (agreement on a central set of problems having to be tackled and on linkages between policy action and desired outcomes)
- Common criteria for validating knowledge (internally defined)

Attention to how epistemic communities articulate and aggregate knowledge provides a way of understanding the agency of politics and policy formation

e.g.: *FRB recruits members of the Strategic Orientation Committee (COS) in epistemic communities such as the RSP (Farmers' seed network)*



#### 4 Conclusion

The concept of epistemic communities is helpful insofar as it proposes a comprehensive analysis of the underlying mainsprings of knowledge construction and by doing that, it generates new ideas for policy debate. This especially applies to observations of plant populations in each particular biotope, which relies heavily on voluntary and local compliance and can hardly do otherwise.

Nevertheless overlaps between the visions are limited, hence the regular harsh confrontations when epistemic communities generate knowledge under their own underlying idea of what it is important.

The recognition of incomplete knowledge does not necessarily lead to the fear of a loss of legitimacy and authority. On the contrary, recognizing the complementarities of different types of knowledge may result in the emergence or requalification of novel knowledge, be it empirical or technical, or premises advancing science.